

REMARKS

The June 4, 2004 Office Action has been carefully considered and the amendments above together with these remarks are presented in a bona fide effort to address each issue raised in that Action. Claims 1-41 are pending in this application. For reasons discussed in detail below, it is believed that all of those claims should be allowable. Hence, prompt favorable reconsideration of this matter is solicited.

Applicants note with appreciation the Examiner's allowance of claims 27-31 and 36-38.

Applicants also note with appreciation the Examiner's indication that claims 20, 23 and 24 would be allowable if recast in independent form. Claim 20 has been recast in independent form by incorporating the limitations of independent claim 16. In so doing, the 'processor' paragraph was revised to essentially correspond to the scope of previous intervening claim 17. Hence, claim 20 should now correspond to its original scope but recast in the form of a new independent claim. Claim 23 has been rewritten, by substantially incorporating the limitations of original claim 21. As such, claim 23 should now correspond to its original scope but recast in the form of a new independent claim. Claim 24 depends from 23 and should be allowable therewith. Hence, claims 20, 23 and 24 also should now be allowable as indicated by the Examiner.

Claims 1, 7, 16, 21, 25, 26 and 32 stand rejected under 35 U.S.C. § 102(b) as anticipated by USP 5,535,522 to Jackson (hereinafter the Jackson '522 patent). Claims 2-6, 8-15, 17-19, 22 and 33-35 were rejected under 35 U.S.C. § 103 as obvious over the Jackson '522 patent. The obviousness rejection is based on an allegation that the listed claims specified only known computer "peripheries" and an allegation that use thereof would have been obvious over the Jackson '522 disclosure of a basic visual wheel alignment system. The two art rejections are traversed. For discussion purposes, claims are treated in numerical order.

Independent claim 1 relates to an imaging module for use in a system implementing a machine vision application. This imaging module includes an image sensor, a processor and a data communication interface. In the module, the processor is for calculating gradient information from the image data provided by the sensor. The data communication interface in turn enables transmission of the gradient information to a host, that is to say to a device implementing the machine vision application. The applied Jackson '522 patent discloses a machine visions system, specifically, for a wheel alignment application, which uses image sensors and communicates image data to a host computer. However, the Examiner has not identified any point in the Jackson '522 patent which fairly suggests that a processor coupled to the image sensor performs a gradient calculation on the image data, before communication thereof to the host computer. Absent the gradient calculation and communication of gradient information from the processor to the host, the applied '522 patent does not meet all the limitations of independent claim 1. Hence, the anticipation rejection of claim 1 is improper and should be withdrawn.

Claims 2-6 depend from claim 1 and are distinct from the applied Jackson '522 patent for the same reasons as is claim 1.

In addition, it is submitted that the features added via these dependent claims would not have been legally obvious over the Jackson '522 patent, as asserted in the obviousness rejection. Under relevant legal precedent, the burden falls on the Office, and thus on the Examiner, to present clear factual evidence supporting all necessary elements of the prima facie case of obviousness. See e.g. *In re Lee*, 277 F. 3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002) (obvious determination vacated for lack of evidentiary support for conclusory statements regarding obviousness to select and combine); and *In re Zurko*, 258 F. 3d 1379, 59 USPQ2d 1693 (Fed. Cir. 2001) (deficiencies of the cited references cannot be remedied by general allegations of "basic knowledge" or common sense). Official notice or a general unsupported allegation that "computer peripherals" alleged to meet the

dependent claim limitations may be known in a general context is insufficient in this case to show that it would have been obvious to use such known “computer peripherals” specifically in the imaging module for a machine vision system such as that disclosed by the Jackson ‘522 patent. It is respectfully submitted that mere knowledge of existence of such elements or features would not teach how or why to modify the system of Jackson ‘522 and therefore would not necessarily lead one of skill in the art to use them in the specific module and/or the specific ways recited in claims 2-6. If the limitations of any of the claims are so well known that there is any real relevant teaching to add or modify the image sensor module of the ‘522 patent in some manner to meet the specific dependent claim limitations, then the Examiner should come forward with appropriate evidence, to allow Applicants an opportunity to consider and respond to the evidence and/or to provide an adequate record if an Appeal becomes necessary. Absent citation of appropriate evidence on the relevant points, the art rejection (103) of claims 2-6 is improper under the relevant legal precedents and should be withdrawn.

In view of the unsatisfied limitations of the independent claim and the failure to provide evidence showing a reason why the addition of the dependent limitations would have been obvious, claims 2-6 should be patentable over the applied Jackson ‘522 patent.

Independent claim 7 is another claim to an imaging module for a system implementing a machine vision application, where the imaging module includes an image sensor, a processor and a data communication interface. In this claimed module, the processor performs a background subtraction or a gradient calculation or both, on the image data from the image sensor. The processor compresses the resulting pre-processed image information, and the data communication interface transmits the compressed pre-processed image information from the processor to a host implementing the machine vision application. The Examiner has not identified any point in the Jackson ‘522 patent which fairly suggests that a processor coupled to the image sensor performs the

claimed preprocessing, that is to say background subtraction and/or gradient calculation in combination with data compression. Consequently, there appears to be no disclosure to meet the claim requirement for the interface to transmit the compressed pre-processed image information from the processor to a host. Since there is no indication of how Jackson '522 meets these limitations of the independent claim, the anticipation rejection of claim 7 is improper and should be withdrawn.

Claims 8-15 depend from claim 7 and are patentably distinct from the applied Jackson '522 patent for the same reasons as is claim 7. In addition, it is submitted that the features added via these dependent claims would not have been obvious over the Jackson '522 patent, as asserted in the obviousness rejection. In view of the precedent cited above, a general allegation that "computer peripherals" meet the dependent claim limitations may be known in a general context is insufficient in this case to show that it would have been obvious to use such known "computer peripherals" specifically in the imaging module for a machine vision system such as that disclosed by the Jackson '522 patent. In view of the distinction provided by the independent claim and the absence of Office citation of specific evidence to show how and why it would have been obvious to add such "computer peripherals" to a machine vision imaging module, the obviousness rejection of dependent claims 8-15 is legally untenable and should be withdrawn.

Independent claim 16 relates specifically to a wheel alignment system, comprising an imaging module and a host computer. The module includes an image sensor, a processor and a data communication interface. The processor is for performing a background subtraction and/or a gradient calculation on information from the image data from the image sensor. The resulting data communication interface transmits the pre-processed image information from the processor, and the host computer processes that pre-processed image information to determine at least one wheel alignment parameter of the vehicle. The Examiner has not identified where or how the Jackson

'522 patent satisfies the imaging module processor requirements, for performing either a background subtraction or a gradient calculation. Likewise, the Examiner has not identified where or how the Jackson '522 patent satisfies the requirements that the interface sends resulting data obtained by a background subtraction or a gradient calculation to the host or that the host processes such data to determine a wheel alignment parameter. Since there is no indication of how Jackson '522 meets these limitations of the independent claim, the anticipation rejection of claim 16 is improper and should be withdrawn.

Claims 17-19 depend from claim 16 and are distinct from the applied Jackson '522 patent for the same reasons as is claim 16. In addition, it is submitted that the features added via these dependent claims would not have been obvious over the Jackson '522 patent, as asserted in the obviousness rejection. For example, claim 17 adds compression, claim 18 requires that the processor perform both the background subtraction and the gradient calculation. Claim 19 depends from 18 and adds compression of the pre-processed data derived from the combination of background subtraction and gradient calculation. In view of the lack of evidence, it is respectfully submitted that it would not have been obvious to add the dependent claim features to the wheel alignment system of the Jackson '522 patent. In view of the distinction provided by the independent claim and the absence of Office citation of specific evidence to show how and why it would have been obvious to add the dependent claim features to a machine vision imaging module, the obviousness rejection of dependent claims 17-19 is legally untenable and should be withdrawn.

Claim 21 relates to method of image processing, for a machine vision application. The method entails capturing an image and generating image data representing the captured image. Gradient information is calculated from the image data, and the gradient information is transmitted to a host processor implementing the machine vision application. Claims 25 and 26 depend from 21 and incorporate these limitations. The Examiner has not identified any point in the Jackson '522

patent which fairly suggests gradient calculation on the image data, before communication thereof to the host computer, or transmission of gradient information to a host processor, in the context of a machine vision application. Absent the gradient calculation and communication of gradient information from the host, the applied '522 patent does not meet all the limitations of independent claim 21. Hence, the anticipation rejection of claims 21, 25 and 26 is improper and should be withdrawn.

Claim 22 depends from claim 21 and is distinct from the applied Jackson '522 patent for the same reasons as is claim 21. In addition, it is submitted that the features added via this dependent claim would not have been obvious over the Jackson '522 patent, as asserted in the obviousness rejection. Dependent claim 22 adds a step of compressing the gradient information; and it is the compressed gradient information that is transmitted to the host processor. Although image data compression is known in the general sense, there is no evidence of record to such that its use in the context of a machine vision method as recited in claim 22 would have been obvious. For at least these reasons, the obviousness rejection of claim 22 is improper and should be withdrawn.

Independent claim 32 is an 'improvement' type claim. The preamble of the claim places it in the context of a wheel alignment system having an image sensing module and a host processor for calculating a vehicle wheel alignment parameter in response to image data communicated from the image sensing module. The claimed improvement in such a system is in the image sensing module, which comprises an image sensor circuit, a field programmable gate array (FPGA) and a communication interface. The FPGA is for pre-processing the digitized images from the sensor circuit. The communication interface is for sending pre-processed image data produced by the FPGA to the host processor. The Examiner has not identified any express disclosure in the '522 Jackson patent of using an FPGA and communication pre-processed image data from the FPGA, nor has the Examiner explained any rationale for a conclusion that such features might somehow be

inherent in the alignment system of that patent. It is respectfully submitted that the applied '522 patent does not meet all the limitations of independent claim 32, therefore the anticipation rejection of claim 32 is improper and should be withdrawn.

Although claim 32 was not included in the obviousness rejection, it is noted that the Examiner rejected several dependent claims (e.g. 3 and 8) with narrower FPGA limitations for obviousness over the '522 Jackson patent. However, no evidence was cited to show how or why use of an FPGA in the claimed context in an imaging module of a wheel alignment system would have been obvious to one of ordinary skill in the wheel alignment art. It is respectfully submitted that the addition of an FPGA to the imaging module for pre-processing and the transmission of the pre-processed from the FPGA to the host, as in claim 32, would not have been obvious. Hence, claim 32 patentably distinguishes over the applied patent document.

Claims 33-35 depend from claim 32 and are patentably distinct from the applied Jackson '522 patent for the same reasons as is claim 32. Furthermore, in view of the lack of evidence to support the obviousness rejection of these claims, it is respectfully submitted that it would not have been obvious to add the dependent claim features to the wheel alignment system of the Jackson '522 patent. For at least these reasons, the obviousness rejection of dependent claims 33-35 is legally untenable and should be withdrawn.

New claims 39-41 also are novel and unobvious over the applied Jackson '522 patent. Although they relate to a system, an imaging module and a method, all three of these new claims are specifically directed to wheel alignment. Also, to varying degrees, all three of the new claims require image compression and communication of compressed image information to a host, in the specific context of wheel alignment. The Jackson '522 patent makes no mention of compression, therefore, that patent does not anticipate any of these new wheel alignment claims. Image compression is generally known. However, it is respectfully submitted that its use in wheel

Serial No.: 10/624,940

alignment, specifically to compress image information before communication to a host, would not have been obvious in the sense of 35 U.S.C. § 103. New claims 39-41 therefore patentably distinguish over the Jackson '522 patent and should be in condition for allowance together with original and/or amended claims 1-38.

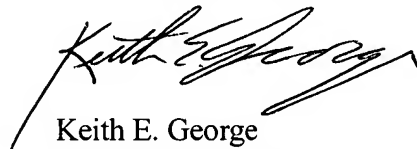
As explained in the remarks above, all of the pending claims should be in condition for allowance. Accordingly, this case should now be ready to pass to issue; and Applicants respectfully request a prompt favorable reconsideration of this matter.

It is believed that this response addresses all issues raised in the June 4, 2004 Office Action. However, if any further issue should arise that may be addressed in an interview or an Examiner's amendment, it is requested that the Examiner telephone Applicants' representative at the number shown below.

To the extent necessary, if any, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "Keith E. George", with a stylized flourish at the end.

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